

BITUMINOUS SOFT BODY TISSUES IN THE BODY CHAMBER OF THE LATE TRIASSIC CERATITID *AUSTROTRACHYCERAS* FROM THE AUSTRIAN ALPS

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The ultrastructure of the black bituminous substance from the body chamber in six shells of the late Triassic ceratid *Austrotrachyceras* was investigated with the scanning electron microscopy and energy dispersive spectrometry to elucidate whether it originated from the soft body tissues. The shells come from the Carnian beds in Austrian Alps, at Polzberg, near the town Lunz, Niederösterreich.

Ultrastructural comparison with (1) bituminous plant remnants from a shale slab with *Trachyceras* shells, (2) black pitch from an orthoconic cephalopod shell from the Ordovician in Sweden, (3) industrial asphalt, (4) dried ink from recent squid *Loligo*, (5) fossilized organic substances in Jurassic “fossil squids” *Loligosepia* and *Teudopsis*, (6) fossilized mantle in belemnoids *Belemnoteuthis* and (7) in *Megateuthis*, (8) ink from a fossilized ink sacs of Aptian coleoids and (9) of late Carboniferous coleoids, (10) siphonal tube of the Aptian ammonite *Aconeceras* provided the evidences that the analyzed black mass in *Austrotrachyceras* living chamber represents diagenetically changed soft body tissues, in places intercalated by dispersed, fossilized ink substance.

In *Austrotrachyceras* the external mantle surface shows a regular rectangular pattern with the diameter of the cells about 3-4 µm. Their size and shape are similar to those of the nacreous tablets of the nacreous layer on the inner surface of the body chamber. The mantle shows fine lamellar ultrastructure and parallel, fine striation but it lacks a pattern of alternating circular and radial bundles of muscles fibres in fossil coleoids and a criss-cross pattern of the mantle tunic of belemnoids. This is interpreted as an evidence of a “primitive” structure of a less muscular mantle in *Austrotrachyceras* and in ammonoids in general.

The idea that the ammonoids had an ink sac (Lehmann, 1967; Mazur, 1971) was supported by new observations.